

REMARKS/ARGUMENTS

Claims 1-13 are pending in the present application. Claims 1-5 and 7-13 are amended. Support for the claim amendments can be found in the claims as filed and in paragraphs 24 and 26 of the application as filed. Reconsideration of the claims is respectfully requested.

I. Interview Summary

On February 5, 2007, the examiner and the undersigned attorney discussed the above amendments to claim 1. The Examiner agreed that the amendments would overcome the current § 102 rejections. No other agreement was reached.

II. 35 U.S.C. § 112, Second Paragraph

The examiner rejected claims 1, 4, and 7 as indefinite. Applicants have amended the claims accordingly. Therefore the rejection of claims 1, 4, and 7 has been overcome.

III. 35 U.S.C. § 102, Anticipation

The examiner rejected Claims 1 and 4-6 as anticipated by *Wong et al.*, Fault-Resilient Automobile Control System, U.S. Patent 5,957,985 (September 28, 1999) (hereinafter “*Wong*”).

Regarding claim 1 the examiner states that:

As to claim 1, Wong discloses a method for operating an embedded system covering a plurality of technical applications, the operative functions of which are performed with a respective plurality of application-specific Electronic Control Units (ECU) (10, 12, 14, 16, 18), each ECU having separate need of resources regarding at least processing and storage subsystem, characterized by the steps of:

a) operating a preselected one of said ECUs as a “donor” ECU (18) being provided with predefined storage subsystem resources (column 3, lines 46-48 & column 4, lines 18-20), and

b) in case of a breakdown of a storage subsystem and/or processing subsystem of an “non-donor” ECU (12) donating respective predefined resources to said breakdown ECU (12) (column 8, lines 50-60).

Office Action dated November 14, 2006, pp. 2-4.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or

process a prior art reference discloses, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). In this case each and every feature of the presently claimed invention is not identically shown in the cited reference, arranged as they are in the claims.

Claim 1 as amended is as follows:

1. (Currently Amended) A method for operating an embedded system covering a plurality of technical applications, the operative functions of which are performed with a respective plurality of application-specific Electronic Control Units (ECUs), wherein each ECU having separate need of resources regarding at least processing and storage subsystems, the method characterized by the steps of:
 - a) operating a preselected one of said ECUs as a “donor” ECU being provided with predefined storage subsystem resources; and
 - b) in case of a breakdown of either a storage subsystem or processing subsystem of a “non-donor” ECU donating respective predefined resources corresponding to either a broken down storage subsystem or a broken down processing subsystem from said “donor” ECU to said “non-donor” ECU, wherein either an unbroken down storage subsystem or an unbroken down processing subsystem remains, and wherein the “non-donor” ECU retains the corresponding unbroken down processing subsystem or the corresponding unbroken down storage subsystem.

Wong does not anticipate claim 1 because *Wong* does not teach the claimed feature of, “wherein either an unbroken down storage subsystem or an unbroken down processing subsystem remains, and wherein the “non-donor” ECU retains the corresponding unbroken down processing subsystem or the corresponding unbroken down storage subsystem.” Nevertheless, Applicants address the Examiner’s statements in order to show that *Wong* does not teach this claimed feature.

For example, the Examiner cites *Wong* as disclosing that:

FIG. 8 shows a case in which the MCU 24 fails. The SCU 26 detects when the MCU 24 fails through continuous monitoring or alternatively through a non-maskable interrupt generated by the MCU 24 immediately prior to failure. *When the MCU fails, the SCU 26 assumes the basic data flow management and control functions of the MCU 24, as well as the processing functions for non-intelligent components 130(1) and 130(2).* The SCU 26 runs the local copy of the MCU code 26' to become the surrogate master of the primary bus 28 and the components 80(1), 80(2), 130(1), 130(2) connected thereto. In this implementation, however, the SCU 26 does not assume the functions of any failed local controller of a component on the vehicle bus. To ensure uninterrupted service to the components on the primary bus 28, the SCU 26 assigns the highest priority to performance of the basic data flow management and control function of the failed MCU 24, and performs all other functions on a resource available basis.

Wong, col. 8, ll. 50-67 (emphasis supplied).

The emphasized text in *Wong* teaches that the SCU completely replaces all functionality of the MCU. The MCU therefore remains idle. Nothing in *Wong* teaches or suggests otherwise.

This fact is in contrast to amended claim 1, wherein either the non-breakdown storage functionality or the non-breakdown processing functionality of the non-donor ECU remains at the non-donor ECU. As amended claim 1 provides, only the failed functionality of the non-donor ECU is transferred to the donor ECU. Therefore, *Wong* does not teach or disclose the retention of either storage or processing functionality by the no-donor ECU, as claimed. Accordingly, *Wong* does not teach each feature of amended claim 1. Consequently, under the standards of *In re Lowry*, the rejection of claim 1 has been overcome.

Because claims 4-6 depend from claim 1, the same distinctions between *Wong* and the invention of claim 1 apply for these claims. Additionally, claims 4-6 claim other additional combinations of features not suggested by the reference. Consequently, the rejection of claims 4-6 also has been overcome.

IV. 35 U.S.C. § 103, Obviousness

The examiner rejected Claims 2, 3 and 7-10 as obvious over *Wong* taken in view of *Heugel et al.*, Mirrored Memory Multi-Processor System, U.S. Patent 5,495,570 (February 27, 1997) (hereinafter “*Huegel*”). This rejection is respectfully traversed. Regarding claim 2, the examiner states that:

As to claim 2, *Wong* discloses the method according to claim 1 further comprising the steps of:

a) operating a preselected one of said ECUs as a “donor” ECU (18) with a storage subsystem (32) being increased for some predetermined degree (column 8, lines 57-60),

b) reserving for at least one non-donor ECU (12) of said ECUs a respective predetermined storage area (50) in the storage subsystem (32) primarily associated with said preselected donor ECU (18) of said plurality of ECUs (column 7, lines 24-26),

c) providing to each non-donor ECU (12) an access to a respective one of said reserved storage areas (50) (column 7, lines 27-29),

d) monitoring the operation of said ECUs, in case of breakdown of a non-donor ECU (12) storage subsystem (24) breakdown (column 8, lines 17-21). *Wong* fails to disclose the steps of:

e) transforming addresses associated with said reserved storage area (50) to new addresses adapted for being accessible by said breakdown ECU (12),

f) assigning access to said non-donor ECU (12) to a respective one of said reserved storage areas (50) by using said transformed new address.

Heugel discloses a multi-processor system having mirrored memory units accessible by either processor (Abstract, lines 1-2). *Heugel* does disclose the steps of:

e) transforming addresses associated with said reserved storage area (50) to new addresses adapted for being accessible by said breakdown ECU (12) (column 5, lines 45-63),

f) assigning access to said non-donor ECU (12) to a respective one of said reserved storage areas (50) by using said transformed new address (column 5, lines 52- 54).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to implement Heugel's method of addressing commonly shared storage areas with Wong's method of providing access to reserved storage areas. A person of ordinary skill in the art would have been motivated to make the modification because if an element fails, redundant data allows continued operation of its paired element to continue processing uninterrupted (column 3, lines 37-39).

Office Action dated November 14, 2006, pp. 4-8.

The Examiner bears the burden of establishing a *prima facie* case of obviousness based on prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). For an invention to be *prima facie* obvious, the prior art must teach or suggest all claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In the case at hand, the cited references do not teach or suggest all of the features of the claims, arranged as they are in the claims.

Heugel discloses a mirrored memory multi-processor system where a plurality of processors can be used to read/write from a plurality of memory units. *Heugel* does not teach or disclose the deficiencies of *Wong* now required by claim 1, namely the retention of either the storage or the processing functionality by the no-donor ECU. Therefore, the combination of *Wong* and *Huegel*, when considered as a whole, does not teach or suggest each limitation of amended claim 1. Consequently, under the standards of *In re Royka*, no *prima facie* obviousness rejection can be made against claim 1 using a combination of *Wong* and *Huegel*.

Because claims 2, 3 and 7-10 depend from claim 1, no *prima facie* obviousness rejection can be made against these claims for similar reasons. Additionally, claims 2, 3 and 7-10 claim other additional combinations of features not suggested by the references. Consequently, the rejection of claims 2, 3 and 7-10 has been overcome.

V. Objection to Claims

The examiner objected to claims 11-13 as dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 11 therefore has been rewritten as an independent claim, incorporating the unamended text of claims 1, 3, and 8-10, each intervening claim. Claim 12 depends from claim 11.

Claim 13 depends from claim 12. In light of the amendments to claim 11, no changes should be necessary to claims 12 and 13. Consequently, the objection to claims 11-13 has been overcome.

VI. Conclusion

The subject application is patentable over *Wong* and *Heugel* and should now be in condition for allowance. The examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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